Case Study #1: Pollution Prevention at Medical Facilities in New Mexico, 2001

This case study number one presents general observations and pollution prevention opportunities for hospitals. The purpose of this document is to establish a framework for pollution prevention and waste management at all hospitals. Four different assessments were conducted at hospitals in New Mexico.

This document has been prepared as part of the City of Albuquerque's Pollution Prevention grant funded by **EPA** for Hospital Pollution Prevention, and is based on a report prepared by ***CGH Environmental Strategies, Inc***. of Burlington, Vermont, who served as project consultants.

Step One: Assess Current Situation and Goals

One of the first questions medical facilities must ask is "Who owns the waste system?" A **process owner should be identified** to oversee waste management and source control. Comprehensive waste management involves the oversight and coordination of multiple waste streams from many departments, staff education, collection schedules, vendor relationships and contracts and regulatory compliance. Overfull sharps containers, variation in container types and placement, absence of data, and uncharacterized hazardous wastes are indicators or symptoms that ambiguity exists.

Most hospital departments generate wastes that are in more than one waste category. A process owner can ensure that wastes in all departments are being managed appropriately and that the myriad of regulatory requirements is met. The goal of a waste management program is to **manage wastes in the most environmentally and economically responsible** fashion, while ensuring regulatory compliance and worker safety are addressed.

Hospitals should accurately determine **waste generator status** by characterizing and counting wastes generated on site. All facilities should address hazardous wastes storage, spill readiness, and furnish materials and training for employees.

Step Two: Identify Pollution Prevention Opportunities

Compactor has side-loading door. Staff do a lot of twisting & bending to retrieve bags of trash from carts and toss into loading door. Have PT/OT conduct a job task analysis to explore optimal ways of loading compactor. Explore automatic cart dumper.

Check lock *out/tag out* program is in place for baler

Check PM schedules on equipment.

Solid Waste

Organizations should examine solid waste quantities, and examine opportunities to reduce solid waste through recycling, reuse, and reduction. Trash collection is low hanging fruit, and can offer obvious opportunities for cost savings.

- Check compactor preventive maintenance schedule for most recent maintenance; checks to see if hydraulic fluid lines are adequate/intact.
- Evaluate trash compactor: preventative maintenance, compaction ratios. This will optimize compactor performance.
- Consider hauling solid waste only when container is full, avoid hauling if not full.
- Collect solid waste (trash) in clear bags (instead of black bags). This allows for continuous quality improvement by inspection of wastes as they are discarded.

- Workers should wear additional PPE (beyond latex gloves) when handling bags of trash.
- Remnants of hydraulic oil 'spill' on the ground indicate the need to develop **spill clean up plans** for hydraulic fluid.
- Request tare slips for every load of solid waste collected to verify how much waste is being generated (and full containers).

Pharmacy-Drain IV bags before disposal as solid waste. Only drain IV bags of Normal Saline, Ringers Lactate. Do not drain cytotoxic or other hazardous pharmaceuticals to sewer.

One of the hospitals using data provided ***by CGH Environmental Strategies, Inc***. determined that 3.5 tons per haul was being generated. The hospital invested $900.00 in maintenance and tune up for their trash compactor to optimize the compaction function. The hospital reduced solid waste hauls from six to four hauls/week. This represents savings of $17,000/year! **A great way to save!**

Chemo waste container (White). Black bag, red bag, odd lids. Container on wooden pallet. Biomedical waste packing supplies are stored randomly.

Disposable sharps container (red) on floor should be packaged in another container to be DOT acceptable.

Biohazard waste

- Review waste acceptance protocols from biomedical collection company.
- Review definition of 'trace' chemo acceptable for disposal in biohazard waste containers. Pharmacy and Oncology departments should ensure only TRACE chemo is being sent off as biomedical waste.
- Expired and unused cytotoxic agents require return through a pharmaceutical reverse distribution firm or through a hazardous waste disposal firm.
- Medical facilities should examine biomedical storage facilities. Are they equipped with hand wash and eyewash resources?
- If there are wood floors in the biomedical storage area they should be painted and sealed to allow for clean up of blood spills and bodily fluids.
- Is the storage area easily accessible? Is it difficult to roll dollies or carts into the area? Does the set-up require unnecessary lifting of heavy containers?

- Heavy containers stacked two high.
- Containers have labels from different institutions. How is vendor keeping track of Hospital's waste? Some containers did not have biohazard label.

- Chemo spill kits should be available in the biohazard waste storage area. Facilities should have a spill prevention plan and protocol for the biohazard waste storage area.
- NM medical waste regulations require absorbent material (pads preferably) in bottom of each waste container. Provide sorbent pads in packing room or utility areas where waste is aggregated to facilitate compliance with this requirement.

- Medical facilities should control who has access to Biomed waste storage area.

- Pathological waste should be ***labeled "for incineration only"*** from point of generation.

- Facility employees should have vendor contact information and waste acceptance protocol available.

- Check with vendor to find out if they offer extra services and products such as sorbent pads/material, a staging area for empty containers, and other services in the contract. Hospitals may want to consider sharing information regarding vendors and compare rates.

- Does your medical facility have a disposal regimen that includes collection at source points for chemo wastes (pharmacy, oncology, and pediatrics) that exceed trace quantities?

Hazardous waste

Hazardous Waste Storage or Hazardous Material Storage?

- Inventory & review storage compatibility of materials. Are their unlabeled items on shelves? Define purpose of space are hazardous materials and hazardous wastes stored seperately? Who has access to hazardous materials and storage facilities?
- Facilities should review RCRA requirements for buildings, containers, spill preparedness, communication devices. See website **http://www.epa.gov/epaoswer/hotline/index.htm** for information on RCRA requirements.
- Reference JCAHO standards that address hazardous materials, hazardous wastes, and list the need for compliance with state, local and federal regulations around hazardous waste.
- Are there less hazardous substitutes available for hazardous material used? For example, solvent substitutes, non-mercury containing instruments, etc. Visit the ***Hospitals for a Healthy Environment*** - Environmentally Preferable Purchasing Site for information: **http://geocities.com/EPP_how_to_guide/**

Universal Waste

Materials such as batteries, thermostats, spent fluorescent lamps, and agricultural pesticides can be collected for disposal under the ***Universal Waste Rule, which*** allows greater flexibility to dispose of some wastes.

- Consider a formalized used battery collection program. Containers for collection should be labeled **used batteries for recycling**. Identify vendors that will recycle batteries and provide documentation. Disposing of batteries under the Universal Waste Rule will help reduce hazardous waste volumes.

- Collect spent fluorescent lamps for recycling or for disposal as a hazardous waste. Recycling carries the least amount of liability and will reduce hazardous waste generation.

Recyclable waste

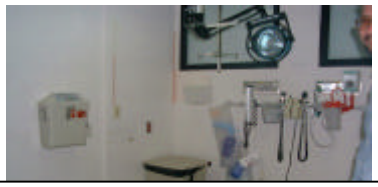
- Recycle cardboard to reduce solid waste pickups. If employees are required to operate a baler. Check to be sure proper *lock out/tag out* program is in place for the baler, and that staff has formal documented training in baler use.

- Medical facilities should make sure collection containers are uniform in appearance, and that they can't be confused with other collection containers, i.e., waste paper collection bins are yellow and hazardous waste containers are yellow.
- Explore diverting other materials for recycling such as steel cans in kitchens, scrap metal, construction and demo wastes. Steel cans from kitchen, aerosol cans, etc, may be allowable as part of scrap metal collection. Check with your vendor

Mercury Pollution Prevention

Inventory and phase-out use of mercury containing healthcare products and devices

- Sphygmomanometers
- Thermometers
- Esophageal dilators from endoscopy



Mercury sphygmomanometers in Exam rooms.

Laboratory Pollution Prevention

- Lab services that are 'contracted out' does not lessen the requirements or responsibilities of hospitals to comply with RCRA regulations. Hospitals are the source of generation. Check with contracted labs to make sure they are complying with RCRA regulations.

Pharmaceuticals collected for return to reverse distributor (RD).

Hazardous Pharmaceuticals

"Characterize" and segregate pharmaceutical wastes including chemo astes for proper disposal. Review vendor's waste acceptance protocol for chemotherapy wastes.

- Utilize reverse distribution firm to divert expired and unused pharmaceuticals

- Uncontaminated PPE can be disposed of as solid waste

Chemo Waste for disposal. Make sure Chemo spill kits are available, and that staff has actual experience with spill clean up or readiness.

- Make sure RD has capability to destroy hazardous pharmaceuticals i.e., epinephrine, warfarin, nitroglycerine

Facilities Management

- Minimize use of solvents, paint thinners, oil based paints
- Storage areas should be purged of all hazardous wastes, unused, outdated and improperly stored materials. Storage areas should be secure, have limited access, and a current inventory of products/wastes should be maintained.
- Facility functions that are outsourced should be "supervised" to ensure proper source control and waste management.
- Facilities should have proper fire suppression equipment, spill readiness materials, emergency contact information, a communication device and other provisions to meet storage requirements.

More Pollution Prevention Opportunities:

- Track positive efforts such as toner cartridge recycling, kitchen grease recycling, durable goods reuse and recycling. Develop a training program on waste management for new employees to optimize participation in waste programs.

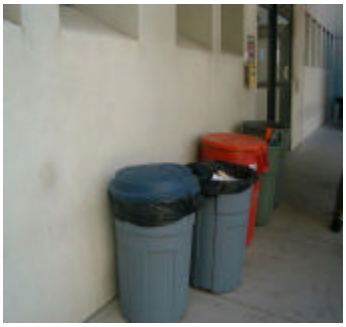
Unlabeled 55-gallon drum & open top. Contents? Uncertain. Avoid accumulating unlabeled barrels of unknown substances.

Oversize red bag containers in ER. Contents of container are solid waste, packaging, food waste, and items, which could be discarded in solid waste at much less cost.

Right-size red bag waste containers.

Create more opportunities for solid waste disposal.

Random unsecured sharps container on admitting desk. Place in secure wall mounted cabinet.



Trash & Biohazard waste containers outside ER door. Red bag containers not secure. Contents included sharps. Remove red bag waste containers from unsecured areas.

Listing of Departments Using Hazardous Materials & Generating Hazardous Wastes

Last Updated: _____ by _____

AREA	DEPARTMENT CONTACT	HAZARDOUS Materials Used/ Hazardous Waste Generated
Laboratory	Name: Phone: Pager	Solvents, formaldehyde, picric acid, acids, alcohols
Pharmacy	Name: Phone: Pager	Hazardous pharmaceuticals, alcohols, epinephrine, warfarin
Radiology	Name: Phone: Pager	Lead aprons, silver from x-ray film, silver from fixer/developer solutions
Facilities: Boiler, Maintenance	Name: Phone: Pager	Cutting oils, freon, solvents, compressed gases,
Print Shop	Name: Phone: Pager	Waste oils, solvents
Oncology	Name: Phone: Pager	Chemotherapy wastes
Dialysis	Name: Phone: Pager	Formaldehyde
Endoscopy	Name: Phone: Pager	Mercury filled dilators
Housekeeping: Chemicals	Name: Phone: Pager	
Central Sterile Reprocessing	Name: Phone: Pager	Ethylene Oxide

Note: Edit this table for your specific organization. Add/delete list of chemicals in right hand column. Update this list at least annually.

Waste Management Contact Information

	Where does it go?	Person Responsible	Vendor's Contact Information	Per Unit Cost	Annual Cost (EST)
Solid Waste Trash					
Biohazard Waste					
Hazardous Wastes					
Recyclable Wastes					
Universal Wastes					
Other Wastes					

The City's p2 Program can help Albuquerque hospitals conduct waste audits. Contact the p2 Program at 873-7058/7059 for more information.